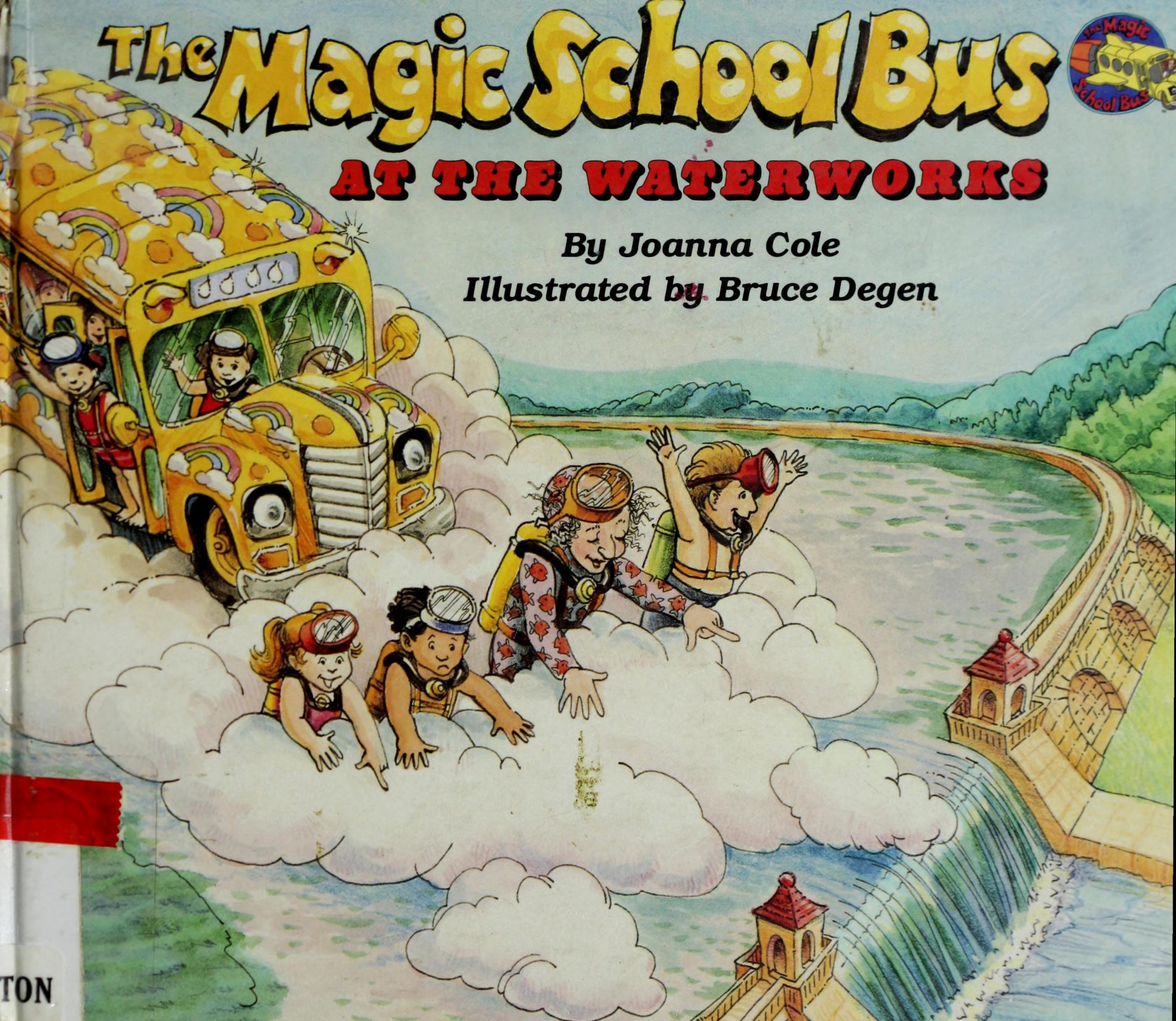
The Magic School Bus

AT THE WATERWORKS

By Joanna Cole
Illustrated by Bruce Degen



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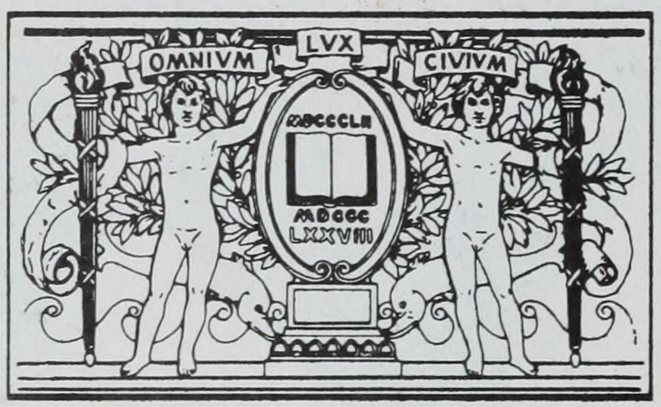

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The Magic School Bus
At the Waterworks

SCHOOL

The Magic School Bus
At the Waterworks

By Joanna Cole Illustrated by Bruce Degen

SCHOLASTIC INC. / *New York*

The author and illustrator wish to thank Nancy Zeilig and the technical services staff at American Water Works Association, Denver, Colorado, for their help in preparing this book.

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To Rachel

J.C.

For Uncle Jerry,
the Water Chemist

B.D.

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Our class really has bad luck.
This year, we got Ms. Frizzle,
the strangest teacher in school.

We don't mind Ms. Frizzle's strange dresses.
Or her strange shoes.
It's the way she acts that really gets us.
Ms. Frizzle makes us grow green mold
on old pieces of bread.
She makes us build clay models of garbage dumps,
draw diagrams of plants and animals,
and read five science books a week.

DOWN, LIZ.

Shell Collection

CHICKEN
ROBIN
WREN
?

ROCKS AND MINERALS

Parts of a Plant by Gregory

SUN

LEAVES make energy from Sunlight

LEAF

HAND

ROOTS get food and drink from SOIL

BUTTER FLIES

BEETLES

REMEMBER:
TRIP TO THE
WATERWORKS
TOMORROW!

My Favorite
by Tim
mammal

CITY DUMP
by Arnold

ZOO
ZOO
ZOO
CIRCUS

BOR-ING!

TYPICAL!

Other classes go on trips to the zoo,
or even the circus.
Guess where we went on our class trip.
To the waterworks!

And to get ready for the trip,
Ms. Frizzle made us
spend a whole month in the library.
We had to find out exactly
how our city gets its water —
down to the last drop.
We also had to collect
ten interesting facts about water.

400
500
I DON'T THINK THERE ARE TEN INTERESTING FACTS ABOUT WATER.
MAYBE FOUR AND A HALF.
WATER FACT #1
by Wanda
About 2/3 of your body is made up of water.

Water Fact #2
by Tim

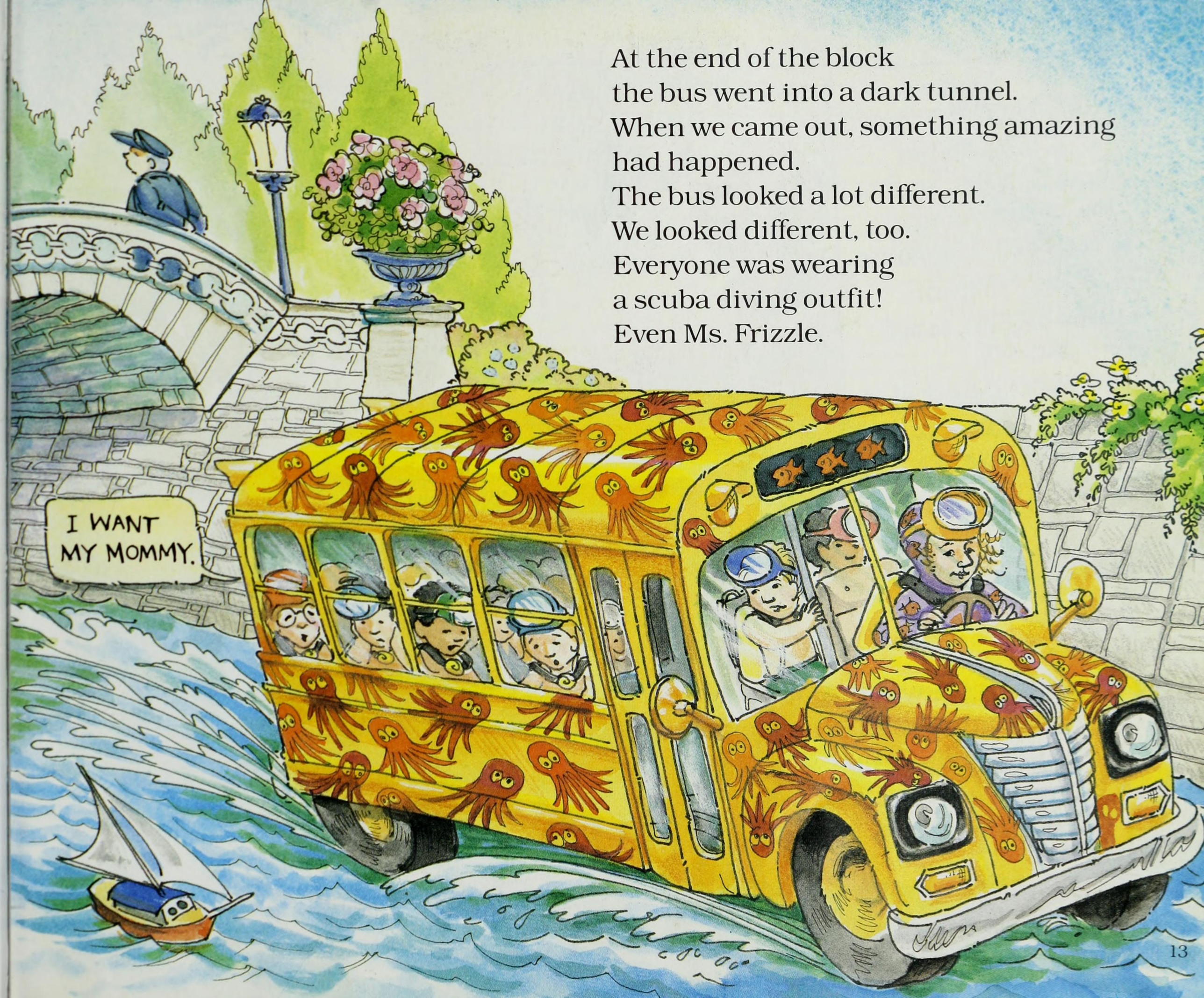
- Water is the only substance that is found in the form of a liquid, a solid, and a gas in nature.
- LIQUID (WATER)
- SOLID (ICE)
- GAS (WATER VAPOR)

OH NO! NOT THE OCTOPUS DRESS!

LET'S PRETEND WE DON'T KNOW HER.

In the parking lot,
the old school bus was waiting.
To our surprise,
there was no bus driver.
Instead, The Friz herself
was behind the wheel.

At the end of the block
the bus went into a dark tunnel.
When we came out, something amazing
had happened.
The bus looked a lot different.
We looked different, too.
Everyone was wearing
a scuba diving outfit!
Even Ms. Frizzle.



WATER FACT *3

by Shirley

There is water in the air you are breathing. You can't see it, because it is in the form of an invisible gas called water vapor.

When water evaporates, it changes from a liquid to a gas and rises into the air.

I DIDN'T KNOW THAT!

WE'RE GOING UP!

Ms. Frizzle was the only one
who didn't seem to notice the change.
She just drove on.
In the middle of a bridge,
the bus started . . .

to rise into . . .

AS YOU KNOW, CLASS, WATER IS ALWAYS EVAPORATING FROM LAKES, RIVERS, STREAMS, AND OCEANS.

ARNOLD, ARE YOU PAYING ATTENTION?

I KNEW I SHOULD HAVE STAYED HOME TODAY.

I WANT MY MOMMY!

YOU SAID THAT ALREADY.

into a cloud.

It went right up . . .

the air.

Then Ms. Frizzle did
the weirdest thing ever.
She told everybody to get
out of the bus!
The kids didn't want to go.
But Frizzie threatened to give
extra homework if we didn't.

Some kids stuck their heads
out of the cloud and looked down.
There were mountains down there!
And the cloud was going higher
every minute.

It was getting colder, too.
All around us,
drops of water began to form.
And as the drops got bigger,
we got smaller!

WATER FACT #4
by FLORRIE

Clouds are water.
The higher up you go,
the colder the air is.
When water vapor
rises, the cold air
makes the vapor form
droplets, which hang
in the air as a mist.
This is a cloud.

HELP! WE'RE SHRINKING!

I WAS ALREADY SMALL FOR MY AGE.

Before long, each kid was
the size of a raindrop.
In fact, each kid was
in a raindrop.
The drops began to fall.
Ms. Frizzle's class was raining!

STAY TOGETHER, CHILDREN.

EEEEE!

IT'S A GOOD THING I BROUGHT MY UMBRELLA.

We fell into a clear mountain stream
and began flowing
down the mountainside.

AH! A RELAXING DAY ON THE WATER.

WATCH OUT FOR ROCKS, CHILDREN.

WATER FACT #5
by Phil

There is exactly the same amount of water on earth now as there was millions of years ago. The water keeps going around and around. It evaporates from lakes, rivers, and oceans, and forms clouds in the sky.

Then it returns to earth again as rain or snow. This process is called the <u>water cycle</u>.

In no time, we reached
the reservoir
that holds water
for our city.
We were going into
the water purification system.
This class trip was
not so boring after all!

EVERGREEN TREES KEEP DUST AND LEAVES FROM BLOWING INTO THE RESERVOIR.

FENCE KEEPS PEOPLE AND ANIMALS FROM DIRTYING THE RESERVOIR.

THIS IS GREAT!

WHAT'S THAT?

INSPECTOR MAKES SURE NO SEWAGE SEEPS IN FROM NEARBY HOUSES.

INSPECTOR MAKES SURE NO TOXIC WASTES ARE DUMPED NEARBY.

SOME WATER WORDS
by Dorothy Ann

A reservoir is a place where water is stored.

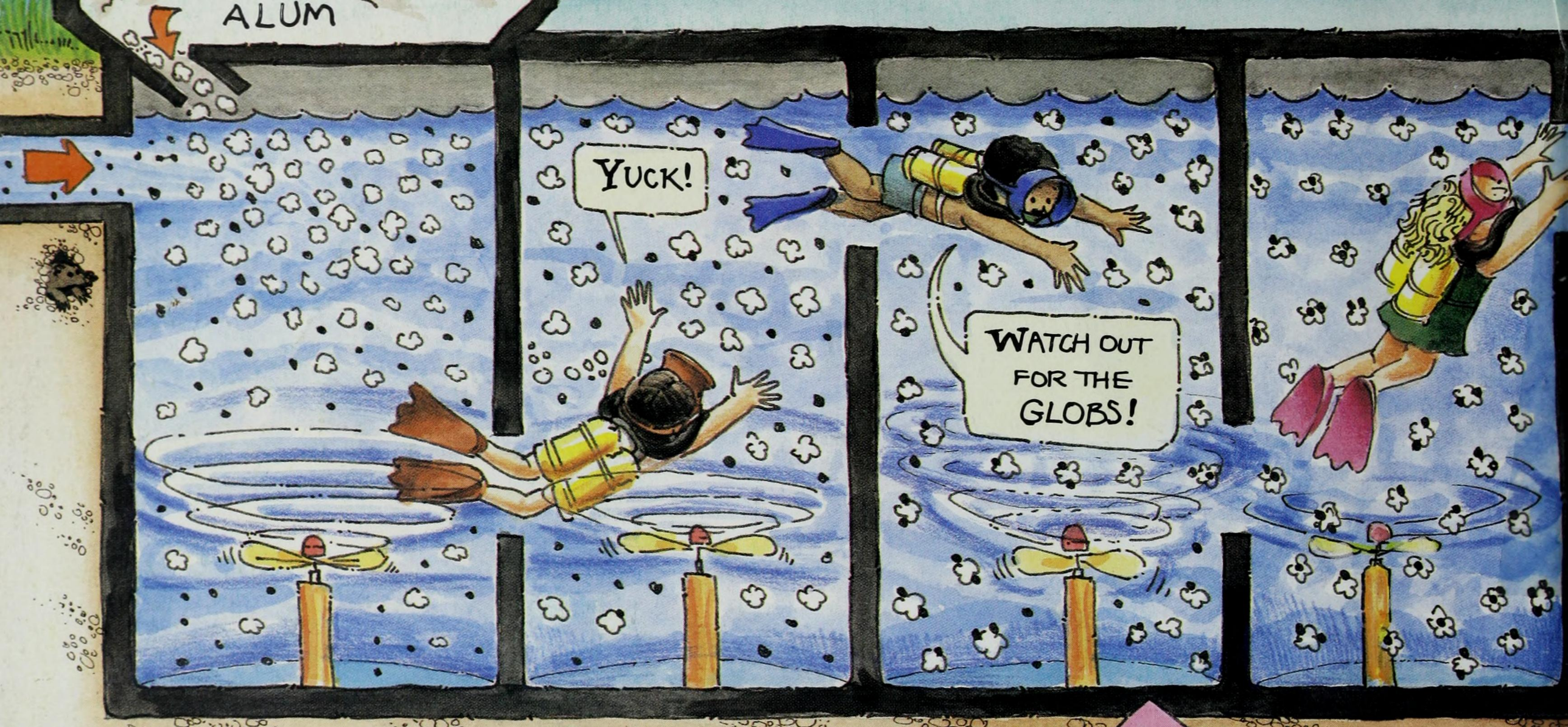
When you purify water you clean it.

WE HAVE REACHED THE RESERVOIR, CHILDREN. FOLLOW ME TO THE WATER PURIFICATION SYSTEM.

ARE YOU LISTENING, ARNOLD?

Not really.

DICTIONARY



The water in the reservoir
was pretty dirty.
We were covered with dirt and mud.
"Follow me to the mixing basin,"
shouted Ms. Frizzle.
In the mixing basin, a clumping substance
called alum was added to the water.
The alum formed globs,
and all the dirt and mud stuck
to the globs.

IT'S ALL CLEAR NOW.

EVERYONE, SWIM UP!

DIRT

WATER FACT #6 by Ralph

Less than 1 percent of all the water on earth is fresh water that we can drink. The rest is salty water in the oceans or frozen water in glaciers or ice caps.

"On to the settling basin!"
ordered The Friz.
There the globs sank to the bottom,
and the clean water flowed off the top.
Now we were on our way to the filter.

WE CAN'T GET THROUGH!

WE'LL BE STUCK IN THE WATERWORKS FOREVER!

OUCH!

This was the sand-and-gravel filter
that takes out any impurities
still in the water.
We were impurities,
we couldn't get through!
Luckily, Ms. Frizzle showed us
a special way around the filter.
When the water came out of the filter,
it was sparkling clear.

CLASS, THESE LAYERS OF SAND AND GRAVEL STRAIN OUT THE TINIEST BITS OF DIRT LEFT IN THE WATER-- EVEN MOST OF THE DISEASE GERMS.

GRAVEL

SAND

STILL ANOTHER WATER WORD

by Dorothy Ann

Impurities are dirt, dust, and disease germs -- anything that should not be in a glass of water.

I WOULD HATE TO FIND YOU IN A GLASS OF WATER.

DITTO TO YOU!

In the pipe from the filter
to a storage tank, a chemical called
chlorine was added to the water.
Chlorine kills any remaining disease germs.
A trace of fluoride was also added
to keep kids from getting
so many cavities.

The water had come all the way
through the purification system.
We thought our class trip was over.
But Frizzie had other ideas.
"Everybody into the storage
tank," she shouted.

WATER FACT #7
by MOLLY

Clear water is not always clean water.

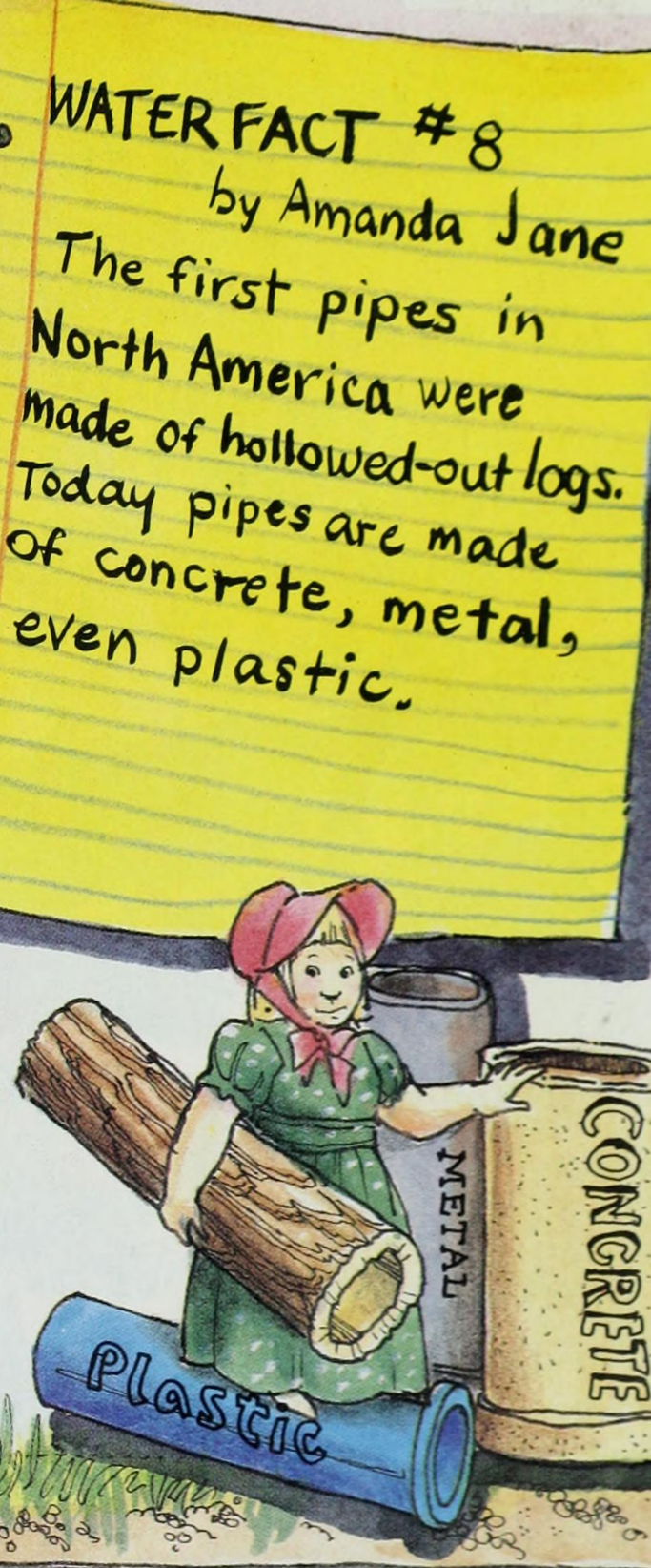
It may still contain disease germs that can make you sick.

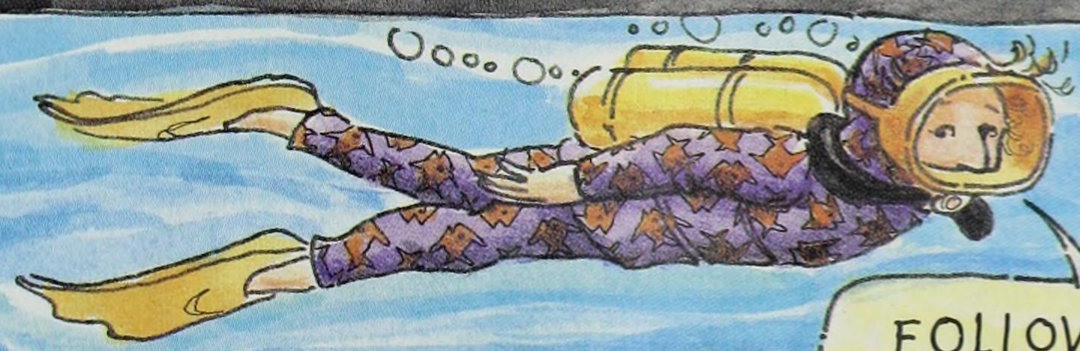
FLUORIDE

CHLORINE

WATER FACT #8
by Amanda Jane
The first pipes in North America were made of hollowed-out logs. Today pipes are made of concrete, metal, even plastic.

Before we knew what was happening, we were whooshed out of the tank and into a pipe that carries water to our city.





Then we went into water mains,
the pipes that run under
the city streets.

THE FORCE OF WATER AS IT MOVES THROUGH THE PIPES IS CALLED **WATER PRESSURE.**

GO WITH THE FLOW, KIDS.

A smaller pipe carried
us to a building.
We went up into
the pipes in the walls.

- WATER FACT #9
by Arnold
Water pressure is usually so strong you can't keep water from coming out of an open faucet with your finger no matter how hard you **press.**

When a seventh-grader
turned on a faucet
in the girls' bathroom,
we came splashing out.
The building was our school!
We were back!
We were our regular size again!
We were dressed in normal clothes again!
(Except for Ms. Frizzle, of course.)

SAVE WATER!

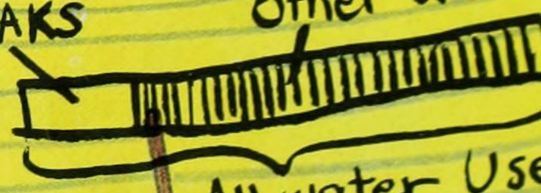
1. TURN OFF FAUCETS WHEN NOT USING.
2. PUT A WATER-SAVING DEVICE ON SHOWER HEAD.
3. FIX LEAKS RIGHT AWAY.

LINE UP, CLASS.

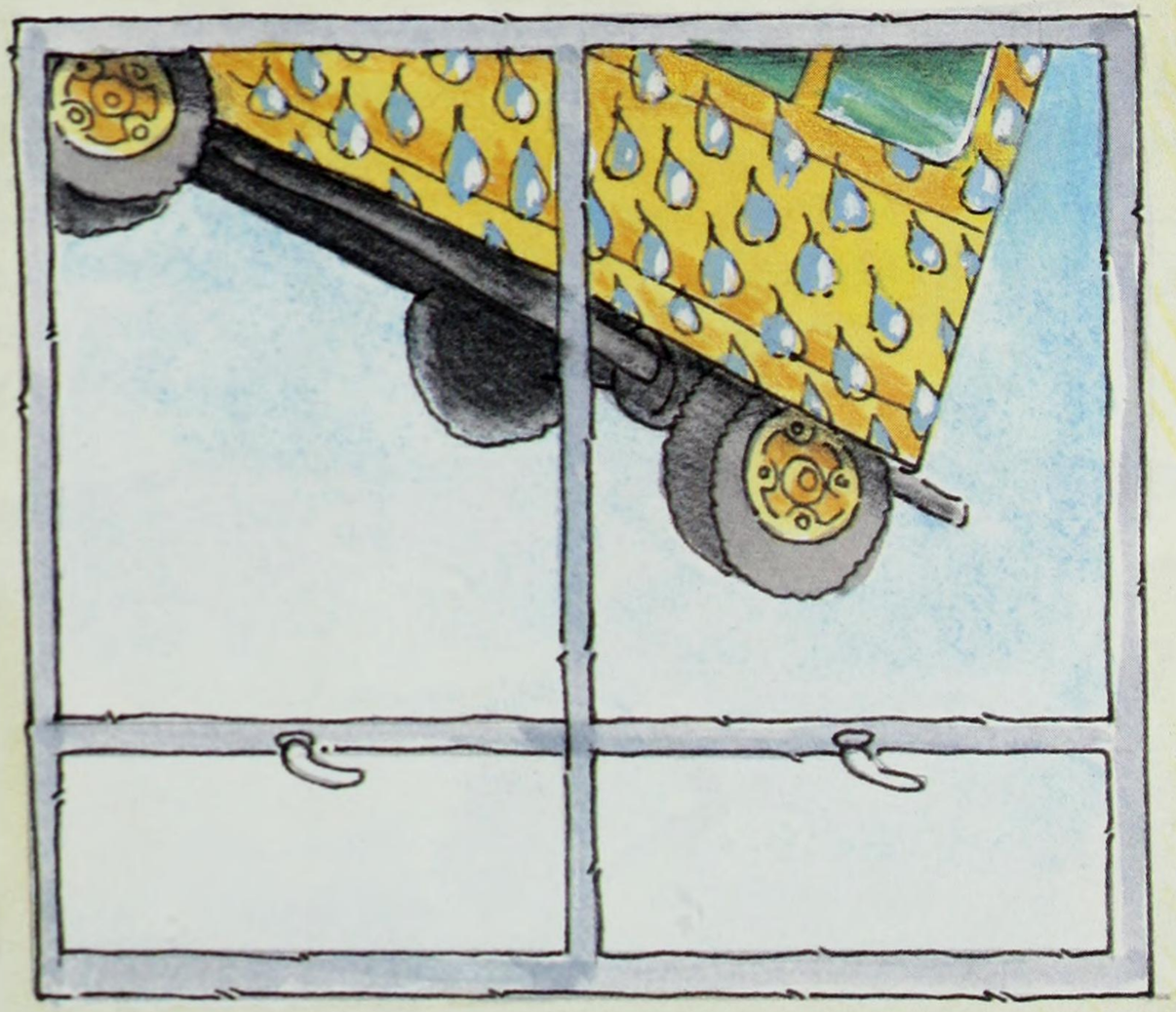
WATER FACT #10

by John

The average city in the United States loses about 1/5 of all its water through leaks.



Back in the classroom,
Ms. Frizzle acted as if
nothing strange had happened.
She started feeding the class lizard.
And she put us to work right away.
We had to make a chart
showing how water gets
to the homes and buildings
in our city.



When Arnold drew a picture of
a kid inside a raindrop,
Ms. Frizzle said,
"Where do you *get* these
crazy ideas, Arnold?"

1
WATER EVAPORATES FROM LAKES, RIVERS, AND OCEANS.

2
CLOUDS OF WATER VAPOR FORM IN SKY.

3
RAIN FALLS TO EARTH. SOME FALLS INTO STREAMS.

4
SOME STREAMS RUN INTO CITY'S RESERVOIR.

5
IN MIXING BASIN DIRT AND MUD STICK TO ALUM CLUMPS.

6
IN SETTLING BASIN, CLUMPS OF ALUM AND DIRT SINK TO BOTTOM.

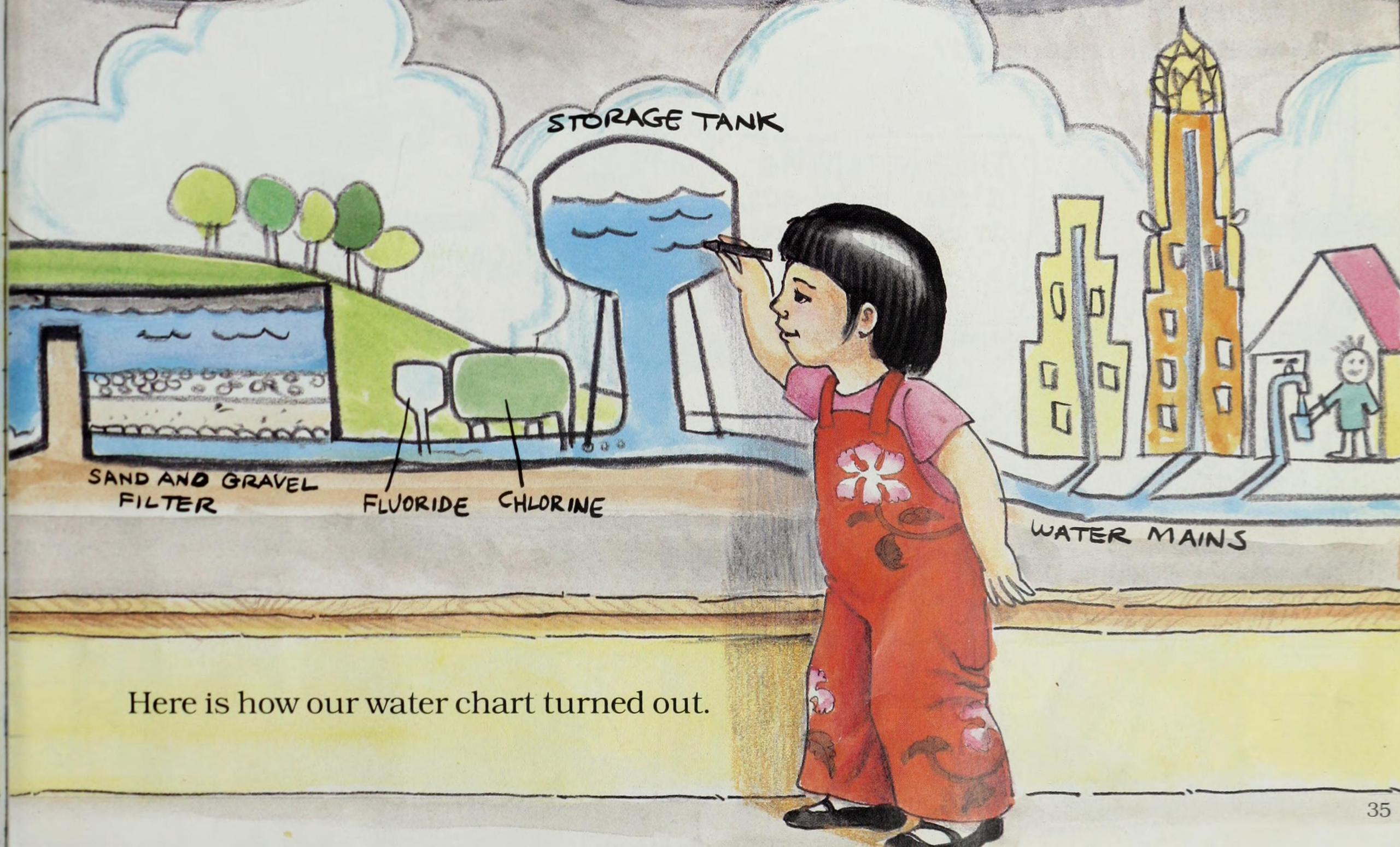
7
SAND-AND-GRAVEL FILTER TAKES OUT LAST IMPURITIES.

8
IN PIPE TO STORAGE TANK FLUORIDE IS ADDED FOR STRONG TEETH. CHLORINE IS ADDED TO KILL EVERY LAST DISEASE GERM.

9
PURE WATER IS HELD IN A STORAGE TANK.

10
WATER MAINS CARRY WATER UNDER CITY STREETS...

11
...TO OUR HOMES AND BUILDINGS.



Here is how our water chart turned out.

Later that day,
we saw the old bus
in the school parking lot.
How did *that* get there?
Did we only imagine going through
the water supply system?
Would we ever find out
what *really* happened?

Ms. Frizzle says we'll be studying
volcanos next.
This makes us all
feel a little nervous!
After all, with a teacher
like Ms. Frizzle,
anything can happen.

NOTES FROM THE AUTHOR
(FOR *SERIOUS* STUDENTS ONLY)

The following notes are for serious students who do not like any kidding around when it comes to science facts. If you read these pages, you will be able to tell which facts in this book are true, and which were put in by the author as jokes. (This will also help you decide when to laugh while reading this book.)

On page 8: The green mold that grows on old bread is actually made up of tiny one-celled plants. It *cannot* talk or make any sound whatever.

On page 9: Plants do *not* have hands, *nor* do they wear sunglasses, and the soil does *not* contain burgers, fries, or shakes.

On page 13: Going through a dark tunnel will *not* cause you to wear a scuba diving outfit.

On pages 14-15: The force of gravity keeps a school bus firmly on the ground. It *cannot* rise into the air and enter a cloud, no matter how much you want to miss school that day.

On pages 16-31: Children *cannot* shrink and enter raindrops, fall into streams, or pass through the water purification system. And boys and girls *cannot* come out of the faucet in the girls' bathroom. (Anyone knows boys are not allowed in there.)

On pages 34-35: Your town or city may not get its water from a mountain reservoir, and the purification process may be slightly different from the one in this book. Many towns get water from rivers, lakes, or wells. Do you know where your water comes from and how it is purified?

On page 36: Once a bus is left behind in a cloud, it *cannot* suddenly appear in the school parking lot all by itself. Obviously, someone has to go back to the cloud and drive it home.

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